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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/741,538

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EXAMINER

CHENG, JACQUELINE

ART UNIT

PAPER NUMBER

3768

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/741,538	<b>Applicant(s)</b> PETERSEN ET AL.	
	<b>Examiner</b> JACQUELINE CHENG	<b>Art Unit</b> 3768	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 October 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-7,9-12 and 14-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7,9-12,14-17 and 19-24 is/are rejected.
- 7) ☒ Claim(s) 18 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1/8/09, 8/21/08</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Response to Arguments*

1. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 2, 5-7, 9-12, 15, and 22-24 and are rejected under 35 U.S.C. 103(a) as being unpatentable over Newman (US 6,544,175 B1) in view of Okado (US 5,348,014 A).
4. **Claims 1, 2, 6, 7, 22-24:** Newman discloses a method and apparatus for adapting signals from an ultrasound transducer comprising a transducer assembly (transducer probe housing 104 combined with connector housing 114, fig. 1) which processes signals from a plurality of elements 106a-106f (fig. 1) to a lesser plurality of elements 112a, 112b (fig. 1) through partial beamforming (col. 4 line 6-7). The processed signals are then converted to a form appropriate for the ultrasound system 126, 102 (fig. 1), in this instance as analog to digital converters 116a, 116b and another beamformer 118a, 118b, 120 (fig. 1). Although Newman does not disclose that transducer assembly is releasably connected to the ultrasound system it is obvious to one skilled

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in the art to make the connection releasable such as taught by Okado (col. 3 line 25-27). It would be obvious to one skilled in the art at the time of the invention to make the transducer assembly 104, 114 (fig. 1) and the ultrasound system 126, 102 (fig. 1) of Newman releasably connected such as taught by Okado for the purpose of portability and easy storage of the transducer assembly.

5. **Claim 5:** Although neither Newman nor Okado explicitly disclose using a digital to analog converter, it would be obvious to have a digital to analog converter in order to make the signals compatible with various systems. Newman discloses that his invention is not limited to any particular ultrasonic apparatus (col. 3 line 20-29), so if a digital beamformer was used and an analog ultrasonic system was used, it would be obvious and necessary to use a digital to analog converter instead of the analog to digital converted.

6. **Claim 9-12, 15:** Newman further discloses the signal processing device of the connector housing 114 (fig. 1) comprising a digital to analog converter 116a, 116b (fig. 1, see also rejection of claim 5 above), and a mixer 120 (fig. 1), however does not disclose the signal processing device being a partial beamformer. Newman does disclose that alternative configurations of the beamforming are possible, so it would therefore be obvious to one skilled in the art at the time of the invention to move the partial beamformer 108a, 108b (fig. 1) from the transducer probe housing 104 (fig. 1) to the connector housing 114 (fig. 1). Furthermore it is also obvious to one having ordinary skill in the art at the time the invention was made to move the partial beamformer from the transducer probe housing to the connector housing, since it has been held that rearranging parts of an invention involves only routine skill in the art (in re Japikse, 86 USPQ 70).

7. **Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over Newman in view of Okado, further in view of Chiang (US 5,839,442). Newman and Okado discloses all of what is claimed as discussed above, except for explicitly disclosing applying different phase shifts in the partial beamformer. Newman discloses using a delay circuit in the partial beamformer, however does not disclose the particulars of how the delay circuit works. It would therefore be obvious to one skilled in the art at the time of the invention to use any well known delay circuit for a partial beamformer such as disclosed by Chiang. Chiang discloses a delay circuit within a partial beamforming circuit using phase delay elements. (col. 3 line 5-7).

8. **Claims 4 and 14** are rejected under 35 U.S.C. 103(a) as being unpatentable over Newman in view of Okado further in view of Pflugrath (US 6,102,863). Newman and Okado discloses all of what is claimed as discussed above, except for partially beamforming demultiplexed signals. Pflugrath discloses a method of beamforming demultiplexed signals 18, 418 (fig. 3, fig. 5, col. 6 line 55-59). It would be obvious to one skilled in the art at the time of the invention to add a demultiplexor to the system of Newman in order to have further control of how and which signals are beamformed (whether it is partial or full beamforming).

9. **Claims 16, 17, 20, and 21** are rejected under 35 U.S.C. 103(a) as being unpatentable over Savord (US 6,013,032). Savord discloses discloses a method for adapting signals from an ultrasound transducer for an ultrasound system comprising partially beamforming signals 42, 48, 52 (fig. 2) from mixing subarrays (subarray 40 comprising five subarrays of five elements each,

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col. 5 line 53-56). Although Savord discloses the converting of the partially beamformed signals in the primary beamformer it would be obvious to one skilled in the art at the time the invention was made to move the converter into the subarray beamformer since Savord discloses that different packaging configurations of the elements can be utilized (col. 6 line 51-56) and furthermore since it has been held that rearranging parts of an invention involves only routine skill in the art (in re Japikse, 86 USPQ 70).

10. **Claim 19** is rejected under 35 U.S.C. 103(a) as being unpatentable over Savord in view of Okado. Although Savord does not disclose that connector housing is detachable, it is obvious to one skilled in the art to make the connector detachable as taught by Okado (col. 3 line 25-27) for the purpose of portability and easy storage of the transducer assembly.

#### *Allowable Subject Matter*

11. Claim 18 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### *Conclusion*

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 5,573,001 A to Petrofsky disclosing sub array mixing for partial beamforming.

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13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JACQUELINE CHENG whose telephone number is (571)272-5596. The examiner can normally be reached on M-F 10:00-6:30.

14. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on 571-272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

15. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JC

/Long V Le/  
Supervisory Patent Examiner, Art Unit 3768